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EXAMINER

IVEY, ELIZABETH D

ART UNIT PAPER NUMBER

1775

DATE MAILED: 09/07/2006

Please find below and/or attached an Office communication concerning this application or proceeding.

DETAILED ACTION

Election/Restrictions

Applicant's election of Group I claims 1-15 in the reply filed on June 20, 2006 is acknowledged. Because applicant did not distinctly and specifically point out the supposed errors in the restriction requirement, the election has been treated as an election without traverse (MPEP § 818.03(a)).

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

The factual inquiries set forth in *Graham v. John Deere Co.*, 383 U.S. 1, 148 USPQ 459 (1966), that are applied for establishing a background for determining obviousness under 35 U.S.C. 103(a) are summarized as follows:

1. Determining the scope and contents of the prior art.
2. Ascertaining the differences between the prior art and the claims at issue.
3. Resolving the level of ordinary skill in the pertinent art.
4. Considering objective evidence present in the application indicating obviousness or nonobviousness.

Claims 1-5, 7-9, 11 and 13-15 are rejected under 35 U.S.C. 103(a) as being unpatentable over U.S. Patent 5,232,469 to McEachron et al. in view of U.S. Patent 6,138,779 to Boyce et al.

Regarding claims 1, 3 and 15, McEachron discloses a metal-coated diamond particles in a metal matrix (column 6 line 65 – column 7 line 4). McEachron does not disclose the coated particles in a matrix as a coating on a substrate. However, Boyce discloses coated cubic boron nitride (CBN) or other superabrasives uniformly distributed in a metal matrix used to form a hardfacing coating on tools to protect the wear surfaces of the tools. Boyce discloses diamonds are known to be used to hardface tools and cubic boron nitride is similar in hardness to diamond (abstract, column 2 lines 35-38 and column 6 lines 23-26). Boyce also discloses that uniform distribution of particles improves both the mechanical bonds and metallurgical bonds which secure the associated hard particles in the matrix (Boyce column 8 lines 25-30). Therefore, it would have been obvious to a person having ordinary skill in the art at the time of the invention to use the metal-coated diamond (superabrasive) particles in a metal matrix of McEachron uniformly distributed as disclosed by Boyce as a coating on a tool to provide good bonding of the particles with the matrix and to protect the wear surfaces of the tool.

Regarding claim 2, McEachron discloses the matrix may be cobalt, nickel, or cobalt/bronze (column 4 lines 23-35).

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Regarding claim 4, McEachron discloses the metal coating on the particles as metals such as silicon, chromium, titanium, tungsten, zirconium, hafnium, vanadium, niobium, tantalum, or molybdenum (column 3 lines 18-22).

Regarding claim 5, Boyce discloses a metal or cermet substrate (column 6 line 65-column 7 line 3).

Regarding claim 7, Boyce discloses various methods may be used to apply hardface coatings including welding, plasma spraying, or flame spray, which use powders, slurries, pastes, tapes or foils, (column 8 line 63-column 9 line 44, column 10 line 64-column 11 line 11). Therefore, it would have been obvious to a person having ordinary skill in the art at the time of the invention to use the methods and thus the material forms of Boyce to form the coating of the McEachron materials.

Regarding claim 8, claim 8 is a product by process claim wherein the patentability of the product does not depend on its method of production. "If the product in the product by process claim is the same as or obvious from a product of the prior art, the claim is unpatentable even though the prior product was made by a different process unless it can be shown that the product produced by the process is in some manner measurably distinct from the product produced by another process." *See MPEP 2113*. As such, the process limitation within claim 8 does not provide patentable distinction over the prior art.

Regarding claim 9, McEachron discloses diamond particle size can vary widely within the range of 1-1500 microns, which overlaps the claimed range of <50 microns (column 2 line 65- column 3 line 2) and Boyce discloses a CBN particle size of about 1 micron. It would have been obvious to a person having ordinary skill in the art at the time of the invention to choose the overlapping portion of the ranges disclosed by the reference because overlapping ranges have been held to be a prima facie case of obviousness, *In re Malagari*, 182 USPQ 549.

Regarding claim 11, Boyce discloses the wear resistant coating may further comprise insoluble particulate borides carbides oxides or nitrides in the metallic coating on the particles to reinforce the coating (*Boyce* column 8 lines 34-38). It would have been obvious to a person having ordinary skill in the art at the time of the invention to use the particulates of Boyce to reinforce the coating of McEachron

Regarding claims 13 and 14, McEachron discloses that the metal coating chemically bonds to the particles and that the coated particles are sintered into the matrix and therefore chemically bonded (column 3 lines 29-31 and column 4 lines 23-36).

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Claim 6 is rejected under 35 U.S.C. 103(a) as being unpatentable over U.S. Patent 5,232,469 to McEachron et al. and U.S. Patent 6,138,779 to Boyce et al. as applied to claim 1 in view of U.S. Patent 5,167,674 to Ika.

Regarding claim 6, McEachron and Boyce disclose all of the limitations of claim 1 in articles for abrasive or wear resistant purposes and Boyce discloses a hardfacing coating is intended to be used on any tool or machine that would benefit from having hardfacing but do not specifically disclose a reinforced organic resin substrate (*Boyce* column 6 lines 41-45). Ika discloses the use of a phenolic resin preform coated with a phenolic resin cement, which can perform a reinforcing function, used with metal-coated CBN or diamond particles for abrasive and wear resistant purposes (*Ika* column 2 lines 43-56 and column 6 line 65 – column 7 line 1). Because steel and resin are common substrate materials and can be used interchangeably as substrates for metal coated diamond or CBN particles and used in abrasive or wear resistant functions, it would have been obvious to a person having ordinary skill in the art at the time of the invention to substitute the substrate of Boyce with a resin substrate as in Ika.

Claim 12 is rejected under 35 U.S.C. 103(a) as being unpatentable over U.S. Patent 5,232,469 to McEachron et al. and U.S. Patent 6,138,779 to Boyce et al. as applied to claim 1 in view of U.S. Patent 4,665,996 to Foroulis et al.

Regarding claim 12, McEachron and Boyce disclose all of the limitations of claim 1 but do not expressly disclose a thickness of the coating, however Foroulis discloses a hardfacing coating thickness on a tool to be 0.01-0.5 inches or about 254-12700 μm overlapping the claimed range (column 3 lines 3-4). Furthermore, it would have been obvious to one of ordinary skill in

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the art at the time of the invention to have selected the overlapping portion of the ranges disclosed by the reference because overlapping ranges have been held to be a prima facie case of obviousness, *In re Malagari*, 182 USPQ 549.

Claim 12 is rejected under 35 U.S.C. 103(a) as being unpatentable over U.S. Patent 5,232,469 to McEachron et al. and U.S. Patent 6,138,779 to Boyce et al. as applied to claim 1 in view of U.S. Patent 6,196,338 to Slaughter et al.

Regarding claim 12, McEachron and Boyce disclose all of the limitations of claim 1 but do not expressly disclose a thickness of the coating, however Slaughter discloses a hardfacing coating thickness of a matrix with a particulate on a tool to be 0.03-0.06 inches or about 762-1524 μm overlapping the claimed range (column 7 lines 34-37). Furthermore, it would have been obvious to one of ordinary skill in the art at the time of the invention to have selected the overlapping portion of the ranges disclosed by the reference because overlapping ranges have been held to be a prima facie case of obviousness, *In re Malagari*, 182 USPQ 549.

Response to Arguments

Examiner acknowledges applicant's affirmation of the election, amendment of claim 8, and cancellation of claims 10 and 16-28.

Applicant's arguments with respect to claims 1-9 and 11-15 have been considered but are moot in view of the new ground(s) of rejection.

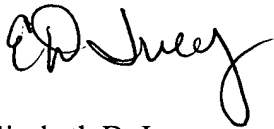
Conclusion

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Elizabeth Ivey whose telephone number is (571) 272-8432. The examiner can normally be reached on 7:00- 4:30 M-Th and 7:00-3:30 alt. Fridays.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Jennifer McNeil can be reached on (571) 272-1540. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

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Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).



Elizabeth D. Ivey



JENNIFER C. MCNEIL
SUPERVISORY PATENT EXAMINER

9/1/06